CIVIL QUALITY CONSULTANTS & ENGINEERS
ISO 9001:2015 Certified & NABL Accredited Laboratory as per ISO/IEC - 17025-2017

Testing of Construction Material - Mechanical, Soil, Bitumen, Non Destructive Testing Services, Project Management Consultants, Third Party Quality Assurance, DPR.

Job No.: CQCE/BBMP/SSK/W.No.16/2020-2021 Date : : 06.01.2021

GRADATION FOR WMM

Client : **Executive Engineer,** R R Nagara Division, BBMP,Bangalore.
Agency : **Sri. S Santhosh Kumar,** Contractor, Bangalore.
Name of Work : Pot hole filling in Jalahalli surrounding areas of Bahubali nagara Sharadhamba nagara Jalahalli village in ward no 16 Jallahalli, BBMP, Bangalore.
IS Code: : IS 2386 (Part 1):1963(RA 2011)
Date of Testing : 06.01.2021
Material Type : Wet Mix Macadam

Oven Dry.Wt, grar 10000

Is Sieve Size in mm	Weight Retained (gm)	Cumulative Weight Retained (gm)	Cumulative % of Retained	Cumulative % of Passing	Requirement as per MORTH 5th edition table no 400.13
53	0	0	0	100	100
45	228	228	2.3	97.7	95-100
22.4	2461	2689	26.9	73.1	60-80
11.2	2038	4727	47.3	52.7	40-60
4.75	1596	6323	63.2	36.8	25-40
2.36	1052	7375	73.8	26.3	15-30
0.600	578	7953	79.5	20.5	8-22
0.075	1629	9582	95.8	4.2	0-5

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For CIVIL QUALITY CONSULTANTS & ENGINEERS

Authorised Signatory

Corporate Off.: No. 133, Bhuvaneshwarinagar, Doddabasti Main Road, Bangalore-560 056.
Contact: 8553518550, 080-23240644 Email: civilqualityconsultants@gmail.com

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Testing of Construction Material - Mechanical, Soil, Bitumen, Non Destructive Testing Services, Project Management Consultants, Third Party Quality Assurance, DPR.

Job No.: CQCE/BBMP/SSK/W.No.16/2020-2021 Date : : 06.01.2021

GRADATION FOR WMM

Client : **Executive Engineer,** R R Nagara Division, BBMP,Bangalore.
Agency : **Sri. S Santhosh Kumar,** Contractor, Bangalore.
Name of Work : Pot hole filling in Jalahalli surrounding areas of Bahubali nagara Sharadhamba nagara Jalahalli village in ward no 16 Jallahalli, BBMP, Bangalore.
IS Code: : IS 2386 (Part 1):1963(RA 2011)
Date of Testing : 06.01.2021
Material Type : Wet Mix Macadam

Oven Dry.Wt, grar 10000

Is Sieve Size in mm	Weight Retained (gm)	Cumulative Weight Retained (gm)	Cumulative % of Retained	Cumulative % of Passing	Requirement as per MORTH 5th edition table no 400.13
53	0	0	0	100	100
45	229	229	2.3	97.7	95-100
22.4	2165	2394	23.9	76.1	60-80
11.2	2234	4628	46.3	53.7	40-60
4.75	1551	6179	61.8	38.2	25-40
2.36	1028	7207	72.1	27.9	15-30
0.600	654	7861	78.6	21.4	8-22
0.075	1687	9548	95.5	4.5	0-5

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Testing of Construction Material - Mechanical, Soil, Bitumen, Non Destructive Testing Services, Project Management Consultants, Third Party Quality Assurance, DPR.

Job No.: CQCE/BBMP/SSK/W.No.16/2020-2021 Date: 06.01.2021

Aggregate Impact Value

Client	**: Executive Engineer,** R R Nagara Division, BBMP, Bangalore.
Agency	**: Sri. S Santhosh Kumar,** Contractor, Bangalore.
Name of the Work	: Pot hole filling in Jalahalli surrounding areas of Bahubali nagara Sharadhamba nagara Jalahalli village in ward no 16 Jallahalli, BBMP, Bangalore.
IS Code	IS 2386 (Part 4):1963(RA 2011)
Type of Mix	Wet Mix macadam
Date of Testing	06.01.2021

Sl No.	Details	Test No. 1	Test No. 2	Average
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	380	382	
2	Weight of agregate passing 2.36 mm sieve after the test = W_2 g	86	88	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	294	294	
4	Aggregate Impact value = percent fines 100* (W_2/W_1)%	22.63	23.04	22.83

Comments:

→ Maximum allowable Aggregate Impact value for Wet mix Macadam is 30%(As per MORTH Specication table 400.12)

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Testing of Construction Material - Mechanical, Soil, Bitumen, Non Destructive Testing Services, Project Management Consultants, Third Party Quality Assurance, DPR.

Job No.: CQCE/BBMP/SSK/W.No.16/2020-2021 Date : 06.01.2021

DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Client	: **Executive Engineer,** R R Nagara Division, BBMP, Bangalore.
Agency	: **Sri. S Santhosh Kumar,** Contractor, Bangalore.
Name of Work	: Pot hole filling in Jalahalli surrounding areas of Bahubali nagara Sharadhamba nagara Jalahalli village in ward no 16 Jallahalli, BBMP, Bangalore.
BIS code:	IS 2386(Part 1) 1963 (RA 2011)
Type of Mix	Wet Mix Macadam
Date of Testing	06.01.2021

Sl no	Test	1	2	Requirements as per MORTH 5th edition table no 400.12
1	Flakiness Index %	11.4	11.6	Combined Flakiness & Elongation index Max 35%
2	Elongation Index %	10.7	10.9	
	Combined Flakiness & Elongation index	22.1	22.5	

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Testing of Construction Material - Mechanical, Soil, Bitumen, Non Destructive Testing Services, Project Management Consultants, Third Party Quality Assurance, DPR.

Job No.: CQCE/BBMP/SSK/W.No.16/2020-2021 Date 08.01.2021

ATTERBERG LIMITS TEST FOR WMM

Client : **Executive Engineer,** R R Nagara Division, BBMP,Bangalore.
Agency : **Sri. S Santhosh Kumar,** Contractor, Bangalore.
Name of Work : Pot hole filling in Jalahalli surrounding areas of Bahubali nagara Sharadhamba nagara Jalahalli village in ward no 16 Jallahalli, BBMP, Bangalore.
IS Code: IS 2720(Part 5):1985
Date of Testing : 06.01.2021 to 08.01.2021
Material Type : Wet Mix Macadam

Sl. No.	Particulars	Test Results	Requirement as per MORTH 5th edition Cl.406.2.1.2
1	Liquid Limit	19.50	-
2	Plasticity Index, %	Non Plastic	6.0% Maximum.

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Testing of Construction Material - Mechanical, Soil, Bitumen, Non Destructive Testing Services, Project Management Consultants, Third Party Quality Assurance, DPR.

Job No.: CQCE/BBMP/SSK/W.No.16/2020-2021 Date 08.01.2021

ATTERBERG LIMITS TEST FOR WMM

Client : **Executive Engineer,** R R Nagara Division, BBMP,Bangalore.
Agency : **Sri. S Santhosh Kumar,** Contractor, Bangalore.
Name of Work : Pot hole filling in Jalahalli surrounding areas of Bahubali nagara Sharadhamba nagara Jalahalli village in ward no 16 Jallahalli, BBMP, Bangalore.
IS Code: IS 2720(Part 5):1985
Date of Testing : 06.01.2021 to 08.01.2021
Material Type : Wet Mix Macadam

Sl. No.	Particulars	Test Results	Requirement as per MORTH 5th edition Cl.406.2.1.2
1	Liquid Limit	21.00	-
2	Plasticity Index, %	Non Plastic	6.0% Maximum.

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Testing of Construction Material - Mechanical, Soil, Bitumen, Non Destructive Testing Services, Project Management Consultants, Third Party Quality Assurance, DPR.

Job No.: CQCE/BBMP/SSK/W.No.16/2020-21 Date: 14.01.2021

TEST REPORT

Client	:	**: Executive Engineer,** R R Nagara Division, BBMP,Bangalore.
Agency	:	**: Sri. S Santhosh Kumar,** Contractor, Bangalore.
Name of the work	:	: Pot hole filling in Jalahalli surrounding areas of Bahubali nagara Sharadhamba nagara Jalahalli village in ward no 16 Jallahalli, BBMP, Bangalore.
IS Code	:	IS 73:2013, IS 1203:1978(RA 2008), IS 1205:1978(RA 2009), IS 1208:1978(RA 2009), IS 1209:1978(RA 2009)
Source of location	:	Hot mix Plant, Bangalore, VG 30
Date of testing	:	14.01.2021

The results of the tests conducted on the bitumen sample using for Bituminous Concrete

Sl. No	Description	Test Result	Requirement as per IS:73:2013
1	Penetration at 25 ^{0}C, 1/10 mm	54	Min 45
2	Softening point, ^{0}C	62	Min. 47
3	Ductility at 27^{0}C, cm	> 100	Min. 40
4	Flash Point, ^{0}C	261	Min. 220

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Testing of Construction Material - Mechanical, Soil, Bitumen, Non Destructive Testing Services, Project Management Consultants, Third Party Quality Assurance, DPR.

Job No.: CQCE/BBMP/SSK/W.No.16/2020-2021 14.01.2021

Aggregate Impact Value

Client	**: Executive Engineer,** R R Nagara Division, BBMP, Bangalore.
Agency	**: Sri. S Santhosh Kumar,** Contractor, Bangalore.
Name of the Work	: Pot hole filling in Jalahalli surrounding areas of Bahubali nagara Sharadhamba nagara Jalahalli village in ward no 16 Jallahalli, BBMP, Bangalore.
BIS Code	:IS 2386(Part 4):1963
Source / Location	Hot Mix Plant, Bangalore
Type of Mix	Bituminous Concrete
Date of Testing	14.01.2021

Sl No.	Details	Test No.		Average
		1	2	
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	389	387	
2	Weight of agregate passing 2.36 mm sieve after the test = W_2 g	84	82	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	305	305	
4	Aggregate Impact value = percent fines 100* (W_2/W_1) percent	21.59	21.19	**21.39**

Comments:

→ Maximum allowable Aggregate Impact value for Bituminous Concrete is 24%(MORTH table no.500.16)

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Job No.: CQCE/BBMP/SSK/W.No.16/2020-2021

14.01.2021

DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Client	: **Executive Engineer,** R R Nagara Division, BBMP, Bangalore.
Agency	: **Sri. S Santhosh Kumar,** Contractor, Bangalore.
Name of Work	: Pot hole filling in Jalahalli surrounding areas of Bahubali nagara Sharadhamba nagara Jalahalli village in ward no 16 Jallahalli, BBMP, Bangalore.
Technical Reference	IS 2386(Part 1) 1963 (RA 2011)
Type of Mix	Bituminous Concrete
Date of Testing	14.01.2021

Sl no	Test	1	2	Requirements as per MORTH 5th edition table no 500.16
1	Flakiness Index	12.3	11.7	Combined Flakiness & Elongation index Max 35%
2	Elongation Index	10.5	11.2	
	Combined Flakiness & Elongation index	22.80	22.90	

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Testing of Construction Material - Mechanical, Soil, Bitumen, Non Destructive Testing Services, Project Management Consultants, Third Party Quality Assurance, DPR.

Job No.: CQCE/BBMP/SSK/W.No.16/2020-2021 16.01.2021

Specific Gravity And Water Absorption Test

Client	**: Executive Engineer,** R R Nagara Division, BBMP, Bangalore.
Agency	**: Sri. S Santhosh Kumar,** Contractor, Bangalore.
Name of the Work	: Pot hole filling in Jalahalli surrounding areas of Bahubali nagara Sharadhamba nagara Jalahalli village in ward no 16 Jallahalli, BBMP, Bangalore.
BIS Code	:IS 2386(Part 3):1963
Type of Mix	Bituminous Concrete
Date of Testing	14.01.2021 to 16.01.2021

Sl. No.	Details	Notation	Test Number			Mean Value
			Test 1	Test 2	Test 3	
1	Weight of aggregate suspended in water with the basket	W_1 g	2020	2022	2021	
2	Weight of basket suspended in water	W_2 g	755	755	755	
3	Weight of saturated aggregate in water	$(W_1 - W_2) = W_s$ g	1265	1267	1266	
4	Weight of saturated surface dry aggregate in air	W_3 g	2011	2013	2015	
5	Weight of water equal to the volume of the aggregate	$(W_3 - W_S)$ g	746	746	749	
6	Weight of oven dried aggregate	W_4 g	2003	2005	2007	
7	Specific Gravity	$W_4/(W_3-W_S)$	2.685	2.688	2.680	2.684
8	Apparent Specific gravity	$W_4/(W_4-W_S)$	2.714	2.717	2.709	2.713
9	Water Absorption	$((W_3-W_4)*100)/W_4$	0.40%	0.40%	0.40%	0.40%

Comments:

→ *Maximum allowable Aggregate Water absorption value for Bituminous Concrete is 2.0%(MORTH table 500.16)*

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Job No.: CQCE/BBMP/SSK/W.No.16/2020-2021 14.01.2021

Aggregate Gradation Test

IS : 2386 Part I

Client	: Executive Engineer, R R Nagara Division, BBMP, Bangalore.
Agency	: Sri. S Santhosh Kumar, Contractor, Bangalore.
Name of the Work	: Pot hole filling in Jalahalli surrounding areas of Bahubali nagara Sharadhamba nagara Jalahalli village in ward no 16 Jallahalli, BBMP, Bangalore.
BIS Code	:IS 2386(Part 1):1963
Sample I / D	Hot Mix Plant, Bangalore
Type of Mix	Bituminous Concrete
Date of Testing	14.01.2021

Total Weight of Sample: **5000** gm

SIEVE SIZE, mm	Weight Retained, gm	% Retained	Cummulative % Retained	% Passing	Requirement as per MORTH table 500.17	Remarks
19	0	0	0	100	100	Gradation satisfies Bituminous concrete Grade-II specification as per MORTH
13.2	417	8.34	8.34	91.66	90 - 100	
9.5	463	9.26	17.60	82.40	70 - 88	
4.75	609	12.18	29.78	70.22	53 - 71	
2.36	655	13.10	42.88	57.12	42 - 58	
1.18	511	10.22	53.10	46.90	34 - 48	
0.600	527	10.54	63.64	36.36	26 - 38	
0.300	498	9.96	73.60	26.40	18 - 28	
0.150	406	8.12	81.72	18.28	12 - 20	
0.075	584	11.68	93.40	6.60	4 - 10	

Total Weight of Sample: **5000** gm

SIEVE SIZE, mm	Weight Retained, gm	% Retained	Cummulative % Retained	% Passing	Requirement as per MORTH table 500.17	Remarks
19	0	0	0	100	100	Gradation satisfies Bituminous concrete Grade specification per MORTH
13.2	401	8.02	8.02	91.98	90 - 100	
9.5	516	10.32	18.34	81.66	70 - 88	
4.75	697	13.94	32.28	67.72	53 - 71	
2.36	523	10.46	42.74	57.26	42 - 58	
1.18	515	10.30	53.04	46.96	34 - 48	
0.600	537	10.74	63.78	36.22	26 - 38	
0.300	554	11.08	74.86	25.14	18 - 28	
0.150	368	7.36	82.22	17.78	12 - 20	
0.075	495	9.90	92.12	7.88	4 - 10	

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Testing of Construction Material - Mechanical, Soil, Bitumen, Non Destructive Testing Services, Project Management Consultants, Third Party Quality Assurance, DPR.

Job No.: CQCE/BBMP/MSR/38/2020-21 18.01.2021

BITUMEN CONTENT AND GRADATION DETERMINATION OF BITUMINOUS CONCRETE

AASHTO T 164 & AASHTO T 30

CLIENT	: Executive Engineer, R R Nagara Division, BBMP,Bangalore.
AGENCY	: Sri. S Santhosh Kumar, Contractor, Bangalore.
NAME OF THE WORK	: Pot hole filling in Jalahalli surrounding areas of Bahubali nagara Sharadhamba nagara Jalahalli village in ward no 16 Jallahalli, BBMP, Bangalore.
SAMPLE ID	:Hot Mix Plant, Bangalore
DATE OF TESTING	18.01.2021

BITUMEN CONTENT DETERMINATION

Description	Sample 1	Sample 2
1. Weight of Mixture before Test, g	500	500
2. Weight of Mixture after Test, g	472	472.6
3. Weight of Asphalt and Mineral matter Extracted, g	28	27.4
4. Weight of Mineral Matter, g.	-	-
5. Weight of Ash, g	-	-
6. Weight of Bitumen Extracted, g. (corrected)	28	27.4
7. Bitumen content in %	5.60	5.48
8. Average	5.54	

GRADATION AFTER EXTRACTION

SIEVE SIZE mm	Test 1 Weight Retained, gm	Cummulative Weight Retained	%Cummulative Retained	% Passing	Requirement as per MORTH table 500.17
19	0	0	0	100	100
13.2	11.5	11.5	2.4	97.6	90 - 100
9.5	68.4	79.9	16.9	83.1	70 - 88
4.75	91.7	171.6	36.4	63.6	53 - 71
2.36	46.5	218.1	46.2	53.8	42 - 58
1.18	41.3	259.4	55.0	45.0	34 - 48
0.600	51.6	311	65.9	34.1	26 - 38
0.300	42.9	353.9	75.0	25.0	18 - 28
0.150	40.6	394.5	83.6	16.4	12 - 20
0.075	51.5	446	94.5	5.5	4 - 10

SIEVE SIZE mm	Test 2 Weight Retained, gm	Cummulative Weight Retained	%Cummulative Retained	% Passing	Requirement as per MORTH table 500.17
19	0	0	0	100	100
13.2	12.2	12.2	2.6	97.4	90 - 100
9.5	69.5	81.7	17.3	82.7	70 - 88
4.75	90.7	172.4	36.5	63.5	53 - 71
2.36	45.4	217.8	46.1	53.9	42 - 58
1.18	41.3	259.1	54.8	45.2	34 - 48
0.600	52.8	311.9	66.0	34.0	26 - 38
0.300	50.6	362.5	76.7	23.3	18 - 28
0.150	32.1	394.6	83.5	16.5	12 - 20
0.075	49.9	444.5	94.1	5.9	4 - 10

For CIVIL QUALITY CONSULTANTS & ENGINEE

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Job No.: CQCE/BBMP/SSK/W.No.16/2020-2021 19.01.2021

BITUMEN CONTENT AND GRADATION DETERMINATION OF BITUMINOUS CONCRETE

AASHTO T 164 & AASHTO T 30

CLIENT	: Executive Engineer, R R Nagara Division, BBMP,Bangalore.
AGENCY	: Sri. S Santhosh Kumar, Contractor, Bangalore.
NAME OF THE WORK	: Pot hole filling in Jalahalli surrounding areas of Bahubali nagara Sharadhamba nagara Jalahalli village in ward no 16 Jallahalli, BBMP, Bangalore.
SAMPLE ID	:Hot Mix Plant, Bangalore
DATE OF TESTING	19.01.2021

BITUMEN CONTENT DETERMINATION

Description	Sample 1	Sample 2
1. Weight of Mixture before Test, g	500	500
2. Weight of Mixture after Test, g	472.3	472.8
3. Weight of Asphalt and Mineral matter Extracted, g	27.7	27.2
4. Weight of Mineral Matter, g.	-	-
5. Weight of Ash, g	-	-
6. Weight of Bitumen Extracted, g. (corrected)	27.7	27.2
7. Bitumen content in %	5.54	5.44
8. Average	5.49	

GRADATION AFTER EXTRACTION

SIEVE SIZE mm	Test 1				Requirement as per MORTH table 500.17
	Weight Retained, gm	Cummulative Weight Retained	%Cummulative Retained	% Passing	
19	0	0	0	100	100
13.2	12.6	12.6	2.7	97.3	90 - 100
9.5	65.9	78.5	16.6	83.4	70 - 88
4.75	90.4	168.9	35.8	64.2	53 - 71
2.36	43.8	212.7	45.0	55.0	42 - 58
1.18	41.7	254.4	53.9	46.1	34 - 48
0.600	38.4	292.8	62.0	38.0	26 - 38
0.300	50.2	343	72.6	27.4	18 - 28
0.150	32.3	375.3	79.5	20.5	12 - 20
0.075	51.6	426.9	90.4	9.6	4 - 10

SIEVE SIZE mm	Test 2				Requirement as per MORTH table 500.17
	Weight Retained, gm	Cummulative Weight Retained	%Cummulative Retained	% Passing	
19	0	0	0	100	100
13.2	13.7	13.7	2.9	97.1	90 - 100
9.5	66.8	80.5	17.0	83.0	70 - 88
4.75	95.4	175.9	37.2	62.8	53 - 71
2.36	40.6	216.5	45.8	54.2	42 - 58
1.18	42.7	259.2	54.8	45.2	34 - 48
0.600	51.3	310.5	65.7	34.3	26 - 38
0.300	52.8	363.3	76.8	23.2	18 - 28
0.150	33.4	396.7	83.9	16.1	12 - 20
0.075	50.6	447.3	94.6	5.4	4 - 10

For CIVIL QUALITY CONSULTANTS & ENGINEERS

Authorised Signatory

Note:

1. This test report should not be reproduced except in full, without written approval of the laboratory
2. The results indicated above are based on the tests carried out on the samples received in the laboratory
3. Any Query regarding the report must be reported within 30 days from the date of issuing

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ISO 9001:2015 Certified & NABL Accredited Laboratory as per ISO/IEC - 17025-2017

Testing of Construction Material - Mechanical, Soil, Bitumen, Non Destructive Testing Services, Project Management Consultants, Third Party Quality Assurance, DPR.

Job No.: CQCE/BBMP/SSK/W.No.16/2020-2021 Date: 19.01.2021

TEST REPORT ON STABILITY OF MIX

Client	:	**: Executive Engineer,** R R Nagara Division, BBMP,Bangalore.
Agency	:	**: Sri. S Santhosh Kumar,** Contractor, Bangalore.
Name of the Work	:	: Pot hole filling in Jalahalli surrounding areas of Bahubali nagara Sharadhamba nagara Jalahalli village in ward no 16 Jallahalli, BBMP, Bangalore.
Source of location	:	Hot mix Plant, Bangalore
Type of Mix	:	Bituminous Concrete
Date of Testing	:	19.01.2021

The results of the tests conducted on the Bituminous Concrete mix sample are as follows:

Sl. No	Description	Test Result 1	Test Result 2	Requirement as per MORTH (Table 500-19)
1	Marshal Stability, Kn	9.22	10.54	9 Kn (min)
2	Marshal flow, mm	3.93	3.71	2 – 4
3	Percent air voids in Mineral Aggregate	13.45	14.62	13 – 15
4	Voids in Compacted Mix	3.02	4.34	3 – 6
5	Percent Voids filled with Bitumen	66.68	70.85	65 - 75
6	Density, g/cc	2.26	2.27	--

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Testing of Construction Material - Mechanical, Soil, Bitumen, Non Destructive Testing Services, Project Management Consultants, Third Party Quality Assurance, DPR.

Job No.: CQCE/BBMP/SSK/W.No.16/2020-2021 Date: 18.01.2021

TEST REPORT ON STABILITY OF MIX

Client	:	**Executive Engineer,** R R Nagara Division, BBMP,Bangalore.
Agency	:	**Sri. S Santhosh Kumar,** Contractor, Bangalore.
Name of the Work	:	Pot hole filling in Jalahalli surrounding areas of Bahubali nagara Sharadhamba nagara Jalahalli village in ward no 16 Jallahalli, BBMP, Bangalore.
Source of location	:	Hot mix Plant, Bangalore
Type of Mix	:	Bituminous Concrete
Date of Testing	:	18.01.2021

The results of the tests conducted on the Bituminous Concrete mix sample are as follows:

Sl. No	Description	Test Result 1	Test Result 2	Requirement as per MORTH (Table 500-19)
1	Marshal Stability, Kn	9.64	10.73	9 Kn (min)
2	Marshal flow, mm	2.12	3.29	2 – 4
3	Percent air voids in Mineral Aggregate	13.57	14.82	13 – 15
4	Voids in Compacted Mix	3.34	5.66	3 – 6
5	Percent Voids filled with Bitumen	68.19	73.0	65 - 75
6	Density, g/cc	2.26	2.25	--

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